

What is claimed is:

1. A ferroelectric capacitor comprising:
  - a bottom electrode;
  - a plurality of projection electrodes formed on the bottom electrode;
  - a ferroelectric layer formed on the bottom electrode and the projection electrodes;and
  - a top electrode formed on the ferroelectric layer.
2. The ferroelectric capacitor of claim 1, wherein spacing between central portions of each projection electrode has a range from 10 % to 20% of a size of the ferroelectric capacitor.
3. The ferroelectric capacitor of claim 1, wherein a size of each projection electrode has a range from 5 % to 10% of a size of the ferroelectric capacitor.
4. The ferroelectric capacitor of claim 1, wherein the top electrode includes a plurality of second projection electrode, each of the plurality of second projection electrodes facing respective ones of the plurality of projection electrodes.
5. The ferroelectric capacitor of claim 1, wherein the projection electrodes are made of bismuth or bismuth alloy.

6. The ferroelectric capacitor of claim 5, wherein the bottom electrode is made of a metal which includes bismuth.

7. The ferroelectric capacitor of claim 1, wherein the projection electrodes are arranged evenly spaced on the bottom electrode.

8. The ferroelectric capacitor of claim 1, wherein the bottom electrode and the projection electrodes are made of a same material.

9. A ferroelectric capacitor comprising:

a first electrode;

a plurality of embedded electrodes which are embedded in the first electrode;

a second electrode; and

a ferroelectric layer which is sandwiched between the first electrode and the second electrode,

wherein the embedded electrodes each include a surface exposed from the first electrode that is in contact with the ferroelectric layer.

10. The ferroelectric capacitor of claim 9, wherein the exposed surfaces of the embedded electrodes in contact with the ferroelectric layer and a surface of the first electrode which are in contact with the ferroelectric layer are substantially coplanar with

respect to each other.

11. The ferroelectric capacitor of claim 9, wherein the embedded electrodes are made of bismuth or bismuth alloy.

12. The ferroelectric capacitor of claim 11, wherein the first electrode is made of a metal which includes bismuth.

13. A ferroelectric capacitor comprising:  
a first electrode which has a rough surface;  
a second electrode; and  
a ferroelectric layer which is sandwiched between the rough surface of the first electrode and the second electrode;

14. The ferroelectric capacitor of claim 13, wherein the rough surface is formed in a bottom electrode.

15. A ferroelectric capacitor comprising:  
a first electrode;  
a second electrode;  
a ferroelectric layer which is sandwiched between the first electrode and the second electrode; and

a plurality of third electrodes formed between the first electrode and the second electrode, wherein the third electrodes generate polarization.

16. The ferroelectric capacitor of claim 15, wherein the third electrodes are formed on the first electrode.

17. The ferroelectric capacitor of claim 16, wherein the third electrodes are arranged evenly on the first electrode.

18. The ferroelectric capacitor of claim 16, wherein the first electrode and the third electrodes are made by a same material.

19. The ferroelectric capacitor of claim 16, wherein the third electrodes are formed on both the first and second electrodes.